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AUTHOR Misko, Josie
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ABSTRACT

This booklet, which is intended for general readers wishing to understand important trends in vocational education and training, provides insight into how self-paced learning programs are being implemented in Australia and how teachers and students evaluate their effectiveness. The following topics are discussed in the first booklet's first seven sections: (1) factors affecting how new information is learned (suitable environment; readiness to learn; analyzing, interpreting, and manipulating the information; attention; feedback; repeated and varied practice; prompting; storing the information); (2) case studies and other research on self-paced learning in external studies programs; (3) technology-based learning for remote students; (4) campus-based self-paced learning programs; (5) the question of whether increased flexibility leads to better outcomes; (6) responsibility for learning; and (7) lessons learned regarding teachers and students best suited to self-paced learning. Presented next is a model for implementing self-paced learning programs that consists of the following nine phases: (1) create a climate for change; (2) identify program needs; (3) set goals and objectives; (4) identify resources to be used; (5) develop learning materials; (6) prepare students for learning; (7) implement the learning program; (8) monitor student progress; and (9) evaluate the program. Concluding the booklet is a 31-item annotated bibliography. (MN)

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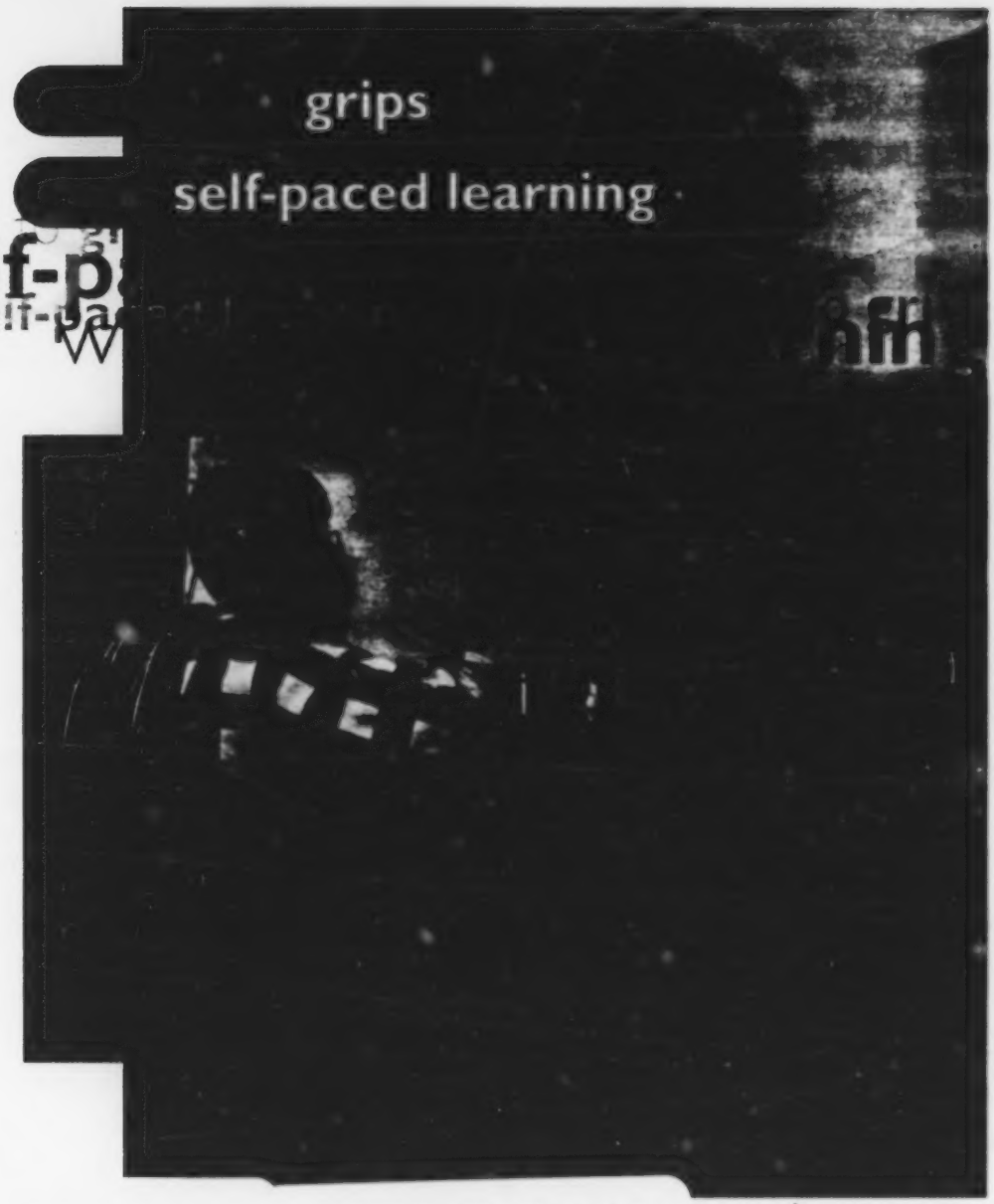

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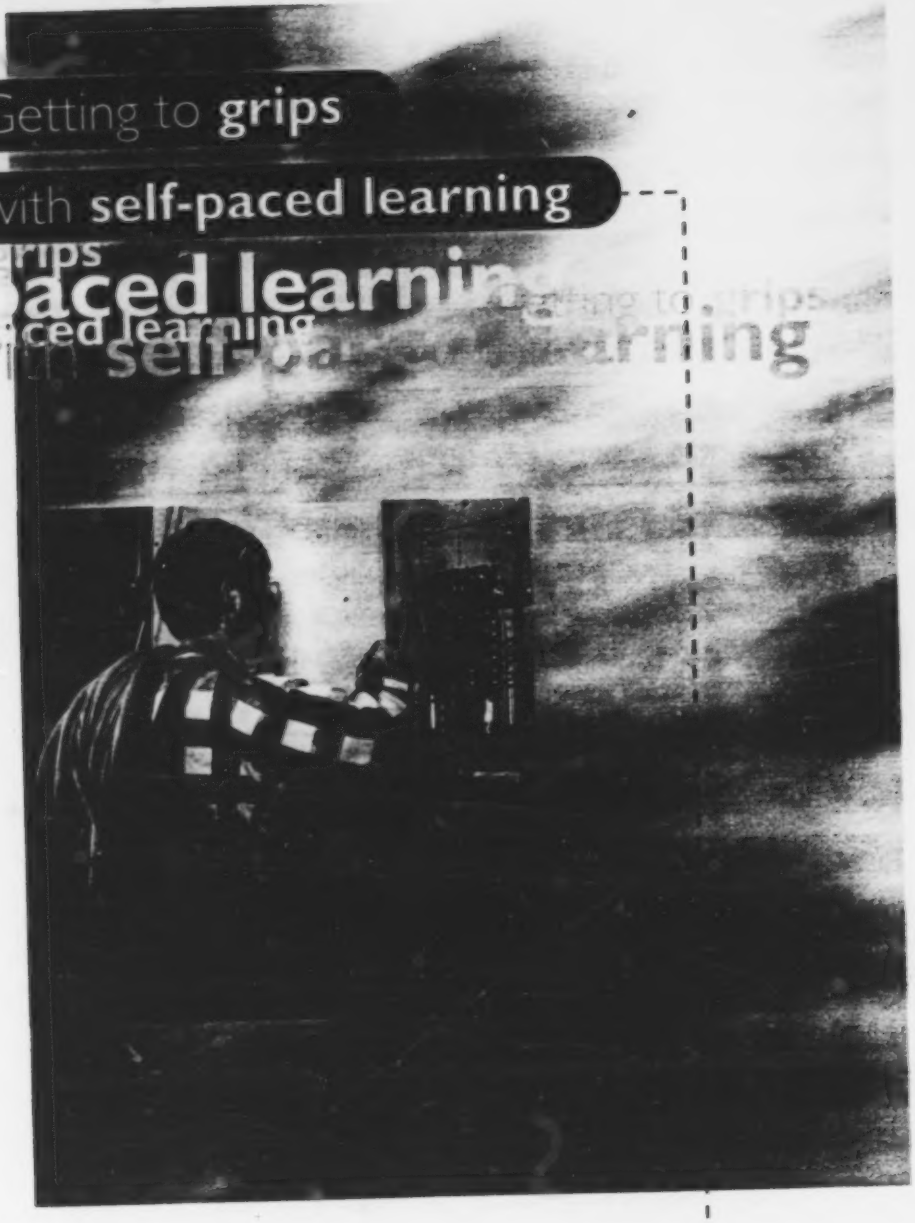

Josie Misko

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In recent years there has been a push towards adopting vocational education and training (VET) programs to meet the need to develop a more highly skilled workforce for Australian industry. This has emerged against a backdrop of political and industrial reforms focussed on enabling Australian industry to compete in the global economy.

Educators have been urged to assist in this development by adopting a more flexible approach to training delivery. This has generally meant providing students with increased choice of what to learn, how to learn it, where to learn it and when to learn it. A justification for these reforms is to prepare students for the modern workplace where workers will be required to work in a more independent manner.

This booklet provides the reader with an insight into how self-paced learning programs are being implemented and how teachers and students evaluate their effectiveness. It also provides a model for implementing self-paced learning programs.

The book is divided into five parts. We begin by reviewing some general principles about how new information is learned. We then briefly review research on self-paced learning. Case studies are presented to examine how self-paced learning is currently being applied and how its effects are evaluated by teachers and students. We then develop a model for the implementation of self-paced learning programs and conclude with an annotated bibliography to assist the reader find more information.

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It is important to understand the basic principles of how we learn. This helps us understand the importance of ensuring students are provided with appropriate environments, resources and opportunities for practice.

There are eight main factors that help us to understand how new information is generally learned.

1 Suitable environment

When we learn new information or skills we are especially influenced by what is going on around us. This includes how comfortable we are in terms of sufficient lighting, heating and cooling, adequate seating arrangements, ability to see and hear the instructor or manipulate the equipment being used. If we have a hearing or vision problem then we are especially dependent on having access to an environment, materials and equipment that make it easier for us to participate in the learning process.

2 Readiness to learn

We are ready to learn new skills or information when we have a particular interest or need, or when we are generally motivated to learn new things. Of course this readiness will also be especially dependent on how healthy we are at the time of learning and whether or not we have the ability to understand the new information or develop the new skill.

3 Analysing, interpreting and manipulating the information

When presented with new information, we generally need to put it into a form which will help us to make sense of it. Typically we first create a mental picture of it in our mind. We will then pick out the important features of this picture and use these to help us analyse and interpret the information. If we have been able to pick out the important features of the picture we are then in a better position to solve problems, understand concepts and develop skills.

During this process, we actively manipulate the information to make it easier to understand. This means we will alter the information to make it

clearer and to fit in with what we already know about similar information or skills.

While we are manipulating the information we are constantly checking our reasons for creating new images and how we are going about doing so. However, we need to be careful that we do not over-do this constant monitoring or it may interfere with our learning.

4 Attention

During learning, our senses are continually being bombarded with information from external events or by thoughts passing through our minds. These distractions affect the amount of attention we are able to devote to the learning. Our ability to minimise distractions will also influence how well we are able to focus on the information being presented.

5 Feedback

The feedback we get for correct or incorrect responses will also affect how well we learn. This means that feedback received from teachers and other students, or our own interaction with equipment, can either help or hinder us in our learning. Positive feedback or praise for work well done can strengthen learning. Negative feedback or disapproval can weaken or eliminate wrong decisions.

6 Repeated and varied practice

We usually require a number of trials before we can master a skill or acquire a new concept. Although repeating the same operation a number of times can help master a new skill so that it can be done automatically, varying the practice can also help to improve the skill once initial learning has occurred. This means that we generally learn best when we are provided with a variety of examples. Repeated and varied practice will also help us to think of other areas in which the skill can be applied.

7 Prompting

Being reminded of already acquired skills or knowledge can often help us to solve current problems or develop new skills. Research studies have shown that prompting can be used to alert learners to information that they already know so they will be able to solve a current problem. This highlights the importance of using prior knowledge in teaching new concepts.

8 Storing the information

Once we have restructured and interpreted the new information, and developed and practised the new skill, we are in a position to commit it to memory. We can do this by attaching it to other knowledge we already have or creating new knowledge structures to house it. Storing information in long-term memory can help us to recall the knowledge long after the information has first been presented to us.

Summary

Understanding how we learn can help us create appropriate learning environments and experiences for students. Especially important is to understand that students' learning is affected by internal and external factors. Internal factors are such things as readiness to learn, thought distractions and the ability to create accurate mental representations of the information being presented. External factors include the physical environment, appropriate resources and equipment, appropriate feedback, clear instructions, regular interaction with teachers and other students, and opportunity for practice.

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External or distance education studies programs have a long history in vocational education and training. They were originally designed to allow students living far from city centres or institute campuses the opportunity to study.

Today the same general principle applies, with students mainly working from printed resources and forwarding assignments and assessments to teachers for marking and feedback. However, students are just as likely to be metropolitan students as they are to be students in remote locations.

Students in external studies programs typically enrol in a course of their choice and are provided with study guides, learning materials and assessments by post. Learning is directed by structured learning materials and is effectively self-paced. Communication between instructors, tutors and students is primarily in printed form via the mail system. Technologies, such as telephones, television, email, and the Internet are increasingly being used.

Benefits and concerns

The main advantage of this type of study is that it allows students to study at times that suit their lifestyles. They are able to fit in work and family commitments with their studies and to speed up or slow down their completion rates. In addition, there is no need to travel long distances to attend regular classes. This is especially important to students who are in full-time work.

Although students benefit from increased flexibility there are also some concerns, for example, lack of immediate access to teachers and lack of interaction with other students. Working independently means that students are not always entirely sure that they have understood concepts. Furthermore when they do get in contact with teachers about a problem, there is not always immediate feedback. Students either have to delay work on a topic until a teacher contacts them, or proceed without fully comprehending what is required. Not having regular contact with other students makes it more difficult for students to share experiences or discuss possible solutions to problems. It also makes it more difficult for them to get an accurate picture of their progress relative to their peers.

For these reasons training providers have put in place a system of tutorials to provide students with personal contact with instructors. In

this way they are assisted with difficulties face-to-face and develop a sense of security in what they are doing.

Some Australian case studies

In this section we report on teachers' experiences of external self-paced learning programs. This includes a brief description of how the method is implemented in particular programs and how teachers evaluate the method in terms of providing successful student outcomes.

The Open Learning Institute in Queensland (OLI), the Open Learning and Technology Network (OTEN) in New South Wales and many departments of separate institutes of technical and further education (TAFE) offer courses which can be studied off campus.

Students choosing to study via this method generally receive all learning materials in printed form and work through the program independently. When they have queries or are experiencing difficulties, they contact tutors and instructors for assistance. In some courses, which require practical workshops, arrangements are made for students to attend institutes offering face-to-face practical workshops.

Accounting at OLI

At OLI, students seeking information about a particular accounting course are first put in touch with a lecturer for selection advice. The student is then sent the necessary forms, subject synopses and textbook lists. Once the student has enrolled and their fees have been received they are sent a set of learning resources. This includes study guides and an assignment list. In some cases students need to buy a textbook. Students are able to enrol at any time and sit exams or lodge assignments when they are ready.

Before the course commences students may attend an optional study skills session provided by the institute library staff. Students are also given other advice on study skills as part of their learning guides. To help keep students on track with their studies they are also encouraged to consider their goals and to complete a timetable so that they schedule in time for study and time for the completion of assignments and assessments.

Students send in completed assignments. Assignments are then sent out for marking to external markers. There is a 21 to 28 day turnaround time. Students generally receive a mark and feedback about three or four weeks after assignments have been received by the centre. To avoid any problems that may come about if papers are lost through the post, students are advised to take a copy of their assignment before sending it in to the assessment centre.

Accounting at TVI

In the Torrens Valley Institute of TAFE (TVI) program, external students receive a letter informing them of how the program will be run. They are also asked to come into the institute to meet with the lecturer before the course commences. Once the course commences, students are at liberty to come in to talk to the lecturer if they require any help. Assignments and assessments are marked by the lecturer responsible for the course.

In the past, external students would generally obtain similar results to on-campus students but they would often take longer to complete their work. Today the department establishes deadlines for the completion of courses. This means that students send in work more regularly and organise their time more effectively.

All students who want to enrol in the course are accepted into the course. This is the case for students who attend classes and for those who choose to do the course externally. To assist students who may be having problems using the external or self-paced mode the institute has established an advanced peer-tutoring program. Here student peer-tutors are paid to provide tutorial assistance to students who have problems. Students may also take a reduced study load.

If these support structures do not provide students with the required assistance then it is not unusual for students to decide that this form of study is not for them. They may either be too young or lack the life skills to deal with the discipline required for independent learning and leave the program. Sometimes they decide to come back to this form of study and find that they can be quite successful.

Hospitality essentials at OTEN is presented in the external/distance education mode. Students deciding to do the module either contact the Tourism and Hospitality Faculty or the course information section for information. A package is sent to them including information on the nature of distance education, enrolment procedures, administrative fees and an enrolment form. When completed enrolment forms and payment are received, students are sent their printed learning guides and other lesson materials. Subject guides also give students tips on how to study via the external/distance education mode.

Although students may enter and exit the course at times which suit them, the campus has in place 'rules of progress'. These lay down the maximum time that students may take to complete a module. Hospitality essentials, on average, takes students one semester to complete and must be completed within two years.

Students work independently through materials and are assessed via four written assignments. When students complete their assignments they forward them to OTEN where they are logged and dispatched to on-site or off-site teachers who provide feedback on assignments. These teachers mark any subsequent assignments from the same student.

There is a strong emphasis on providing comprehensive written feedback on assignments. This feedback provides encouragement, constructive criticism and further direction. Where students are having major problems, teachers will make arrangements to telephone them so that they can discuss remedial action. Students are also asked to call teachers if they have any problems.

Teachers undergo preparation for using the external/distance education method of instruction. This means completing the Basic methods of external teaching course. Teachers must also undertake this course in the

distance mode so that they can discover first hand the experience of the typical student. Once teachers join a department or faculty at OTEN they are provided with information on systems and procedures from their peers and supervisors.

A production unit comprising editors, instructional designers, illustrators, writers and reviewers is responsible for the development and production of learning resources. Teachers responsible for particular subjects are co-opted as subject experts to work with the production unit in the development of the materials for their subjects.

Students who experience problems either due to learning or literacy support needs or physical impairment are able to use the services of the Integrated Learner and Equity Support Unit which provides them with learning support and other forms of assistance. For example, if students are having difficulties reading the materials due to the nature of the print, the unit will arrange to have these converted to a more acceptable format. If they are experiencing literacy problems, the unit will provide them with remedial assistance. If a student who is hearing impaired needs to attend a workplace then a representative of the unit will accompany the student to the workplace.

Engineering at OLI

Engineering at OLI is presented to students in much the same way as other OLI programs. Intending students first register their interest in doing a particular module. The synopsis of the module is sent out to them along with the requisite enrolment, transfer or recognition of prior learning (RPL) forms. When students enrol and pay their fees they are sent a package of resource materials which includes study guides, assignments and learning resources.

Beginning students are provided with information about competency-based training, how to submit assignments and how to get started. This information is attached to a competency-test book.

Completed assignments or assessments are sent to the assessment centre which forwards them to external markers. Some assessments such as exams need to be externally supervised. Students also sign a statutory declaration form to affirm that the assessment or assignment represents their work.

External studies: A challenging way to learn

Teachers from the programs in the institutes used in the case studies believe that learning by external studies is not appropriate for everyone. External studies are considered to be an excellent way to study flexibly. Good results are achieved by students who adopt the method whole-heartedly and are highly motivated to put in the time to complete their work. However, it is generally acknowledged that if deadlines are not set the course may take considerably longer to complete than studies which are done in a face-to-face format.

Another problem with external studies relates to the nature of practical experiences available to students and the lack of adequate time to help students understand concepts. Take the case of students in Tourism and Hospitality courses who may need to become familiar with front-of-house activities. If they find themselves in a traditional face-to-face class, visits to an appropriate hotel or motel will be arranged for them by their teacher. In contrast, students who are undertaking the course via external studies will be asked to make their own arrangements to visit a local motel or hotel. In such a situation the teacher can never be sure that

the local hotel or motel has the facilities that the student should experience.

Because students have to take responsibility for their own learning, teachers believe that external studies can be quite difficult for those who are slow learners or have literacy problems. Therefore it is especially important that students receive appropriate counselling before they start the course. Where there are no prerequisites to courses it is especially important for students to have ongoing support throughout the duration of the course.

One of the greatest problems experienced by providers of these programs is the high drop-out rate. To combat this, providers have begun to adopt more pro-active methods for interacting with students. In the accounting department of OLI a phone call is made regularly to students to see how they are going. In the accounting department of TVI the lecturer tries to maintain contact with students at least once a week and provide one-on-one attention. In addition students are invited to call the TVI lecturer out of work hours if they are experiencing problems. At OTEN teachers provide extensive comments on assignments and follow this up with a phone call to students who are having major problems. Providing this support to students takes time, during and out of work hours, for teachers but this regular contact is considered essential if students are to be kept from dropping out and assisted with their studies.

Although most institutes have established specific learning support structures to help students with their learning, teachers are generally concerned about the literacy skills of students and the ability of students to work independently. Other concerns relate to the time required to prepare instructional materials, the ability of students to read the materials and the ability of students to follow instructions when they are working independently. These concerns generally relate to students with lower levels of literacy or numeracy skills.

Computer-based learning

Computer-based learning generally means that the material in the computer program takes the place of the teacher, and the student works individually and at their own pace with lessons programmed into a computer system or transmitted via the Internet.

For example, word processors can be used for the development of language and procedural skills and learning a foreign language. Spreadsheets and databases can be used to develop problem-solving, analytical and procedural skills. Graphic tools can be used to learn presentation, design skills and artistic expression. In these programs students are learning by doing exercises and solving problems.

Learning via interaction with the computer allows students to have a dialogue with the computer. This means that the student will do exercises on the computer and the computer will react in appropriate ways either by going on to the next exercise if the first exercise has been successfully completed or providing the student with extra practice if the exercise has not been successfully completed. There are programs to help students learn a variety of skills in this way. Learning keyboard skills using a mastery program is an example of an interactive activity.

Learning via communicating across networks allows students to access information, email and computer-conferencing facilities. This means that students are able to link to information on careers, courses at other institute s and reference materials. Computer conferencing allows them to link up with teachers and other students. Email can reduce the amount of time it takes to contact and set up a dialogue with students who are remote from instructors.

Computer-based learning is sometimes adopted to train staff in workplaces. It has been used for the training of word processor operators and clerks in industries like banks and insurance companies. In many cases, however, it has been shown that if this way of learning is not fully integrated into the culture of the organisation it will not be effective. This is also the case if employees find the programs to be boring, pointless or time-wasting.

Not all teaching and learning, however, needs to occur in a technologically-based environment, even if it is fashionable to do so. It is good sense to ensure that learning outcomes require, or might be enhanced by, the use of new technology before systems are committed to fund this approach when less expensive methods will do.

Providing access to information which is transferred via computer, television, videos and audio cassette programs has two main advantages.

- It can expose students to experiences and information that can only be presented via technology-based methods (e.g. different places, experts in the field, different landscapes etc.)
- It also frees teachers to deal with those aspects of the curriculum that they believe should be presented in a face-to-face mode.

It is important that we also understand that not everyone is suited to this mode of learning when they are first being presented with new information. Indeed when students report their most preferred methods for learning, using videos or audio cassettes is their least preferred method.

An online program at University of Ballarat – TAFE Division

An example of a program in which students communicate across networks is the online delivery program provided by the University of Ballarat – TAFE Division in central Victoria. Here the national TAFE Information technology modules are taught predominantly using online facilities. However, students are able to come to a laboratory, especially set up for the program, to use the equipment or to get help at any time during the course. Most of the communication between teacher and students happens via the Internet. Resources comprise study guides which can be accessed online, links to other sites and the text-book. Additional information is regularly placed on the website and bulletin board systems (BBS).

The program recruits students through placing advertisements in local newspapers, brochures, the Internet and through word-of-mouth. Typically, an interested individual who would like to take up the program will call the course manager who will invite them to come in for a discussion. Here the manager will counsel the student to choose an appropriate module and the manager will establish if the student has the required computer skills to work individually online. If the student does not have these basic skills then the manager will counsel the student to undertake the desired module through a more structured approach. (The same module can be taken at the institute in a face-to-face class.)

Once students are enrolled in the online program they can start their program immediately at the laboratory session or go home and start to work. Communication with the instructor is via email. However communication with the instructor during laboratory sessions is face-to-face.

Assessments are conducted on-campus. Although online assessments have been tried in the past, they have been discontinued because teachers need to be able to verify that the individual doing the assessment is the individual enrolled in the program. Consequently students are asked to complete assessments at the institute. This allows teachers to verify students' work and satisfies institute quality assurance requirements.

Perceived effectiveness

The lecturer responsible for this program believes that the effectiveness of the method depends on the ability of students to study in this way. If students are independent learners it is generally believed that they can advance through the module at a fast rate. If they are slower learners then they will have difficulty.

Delivery of instruction online is still in its early development and although the perception is that the method can operate quite effectively in basic modules there are some questions surrounding its effectiveness in content-advanced modules.

Perceived advantages

The main advantages of online delivery for students are convenience and flexibility. Students can work at home when it suits them or they can come to the institute to receive extra help. The main advantages for providers are that institutes can add cutting-edge technology to their training provision and be seen to be providing opportunities for students to be involved in new ways of learning.

Perceived disadvantages

One of the problems associated with online delivery of instruction is to provide adequate and timely feedback for students. This is usually done through email and through the website. However there may be occasions when these are not sufficient. This is especially the case if there are technical glitches, or if teachers have not had the opportunity to provide immediate responses to copious messages or requests for assistance.

Other disadvantages relate to the time and effort required of teachers and the lack of time for students to practise skills and understand new concepts. Time and energy is required to ensure that the course is well structured, and that up-to-date resources are available. Online learning materials need to be of good quality and self-explanatory, so that students can work at their own pace and independently at home.

Summary

Online delivery of instruction is still in its formative stages in Australian TAFE institutes. Early indicators are that it is an effective method for delivery of introductory courses for students who have some basic familiarity with computer skills or who have the motivation and ability to work independently. However its effectiveness for more advanced programs is unclear. It is not suggested as a method for students who are slow learners or who require more structure to get things done. Online delivery is very labour intensive for teachers.

A video-conferencing program at the Murray Institute of TAFE

Video-conferencing strategies are used to improve access to training for students in remote areas. Typically students attend classes at a learning centre with video-conferencing facilities and interact with a lecturer and other students via interactive video. Assignments are marked by the lecturer responsible for delivering the course. Assessments are generally taken in a supervised situation. Video-conferencing can be used to augment class numbers to make it worthwhile for institutes to run a particular subject.

Students in rural or regional areas in South Australia may opt to take accounting modules via video-conferencing. They attend classes by travelling to the video-conferencing centre most convenient to them. The location in which the session is delivered is rotated so that all students can have personal contact with the lecturer at different times during the course.

Assignments are sent to the lecturer for marking. Students must take assessments in a supervised situation.

Perceived advantages

The benefits of video-conferencing are mainly related to the access to training it provides for students in remote areas, and the opportunity for such students to interact with others either physically at the same site or electronically at other sites.

Perceived disadvantages

The main disadvantages associated with video-conferencing are the inability of the lecturer to identify students who are having trouble and the lack of time to help students understand concepts and practise practical skills. In addition there are concerns about the ability of students to work independently. This is especially the case for those students who have literacy problems.

Because personal contact between teacher and student is minimal via this method of instruction the lecturer is not really able to obtain non-verbal cues from students who are not at the site from which the class is being televised. In addition students are also reticent to admit they are having problems understanding aspects of the course. This, in turn, affects the amount of feedback that the lecturer can provide.

The main drawbacks perceived by students relate to the amount of time taken to set up the technology and the self-consciousness associated with being on television or asking questions which they feel may interrupt the flow of the lesson.

There are four main ways that opportunities for self-paced learning are made available to students. These are:

1. external studies programs in which students receive study materials and work on their own away from the campus at which they are enrolled
2. campus-based programs in which students attend at a scheduled time but work through the course materials at their own pace
3. flexible programs in which students decide when, where and how they study but have the option of attending laboratory sessions set up so that they can access equipment and instructors
4. integrated programs in which instruction on major topics is delivered in a traditional face-to-face format and students are left to work through course materials at their own pace choosing when to sit for assessments

Teachers take on a facilitator role in addition to their educator role. This means that they are heavily involved in preparing learning materials, directing students to resources and maintaining accurate records. In addition they need to be prepared to answer student requests for clarification of subject-related content.

Although the focus is on flexibility to allow students to study at their preferred times, teachers have developed different ways to ensure that students are provided with the resources and assistance they require to complete their programs. In some cases it has meant placing some time constraints on activities so that students aim for a deadline and institutes are better able to monitor their resources.

Training providers have not always been able to make these self-paced learning strategies deliver completely flexible entry and exit points for all students, especially for apprentices and trainees. One explanation for this is that when students are in programs to which they are released by their employers to attend classes on one day per week, or in blocks of time during the academic year, it is easier to keep them together working on similar activities.

Electronic engineering at Torrens Valley Institute of TAFE

There are many ways in which institutes provide self-paced learning opportunities. In some programs, like the electronic engineering

program at Torrens Valley Institute in South Australia, students work independently with the option of attending laboratory sessions. They work through the learning guide independently and are able to call on an instructor for help at any time. In this way they are able to self-pace their studies but also receive help when it is required. In addition lecturers are available from 9.00 am to 9.00 pm to answer queries and to help students who do not wish to come into the institute. Communication is generally by email or through a filing system where lecturers place any communication with students into their personal file. Students are also encouraged to work on problems in groups. When students are ready they sit for an assessment which is marked by the instructors. In addition students may request special tutorials.

To prepare themselves for self-paced learning, students must first complete a self-management module. This deals with time management, stress reduction and communication skills. It outlines the objectives of the course and provides them with background information on the institute.

If students are to complete a self-paced learning program they also require adequate reading skills. Before they are able to commence an electronics program at TVI, all students need to take a reading comprehension test. Students who fail the test must take remedial classes.

Hairdressing at Adelaide Institute of TAFE

Hairdressing programs for apprentices at Adelaide Institute of TAFE are predominantly self-paced with students attending regular classes. That is, students attend the institute at a scheduled time, usually to fit in with employer wishes, and remain in class working at their own pace on activities negotiated with lecturers. They are provided with computer-based interactive learning activities, CD-ROMs, videos and folders of learning materials dealing with each major learning area. Students work through these materials at their own pace and according to what they have negotiated with their lecturers. Lecturers provide assistance and training when it is requested. However they continue to be used by most students as the main source of information.

Students take computer-based theory assessments in an assessment laboratory which is supervised by a lecturer. Practical competency tests are performed in front of a lecturer. In one subject two lecturers will be present to assess student competencies.

Although the focus is on self-paced learning, instructors regularly monitor students' work folders to ensure that they are on track and that they are not spending too much time in some areas and not enough on others. If students have not made adequate progress then lecturers counsel them on the topics that they need to work on. (If the problem is serious then employers will also be involved.) This monitoring means that although students are generally working individually through their learning programs lecturers maintain a vigilant eye on their progress. Teachers have found that this method brings out the best results for all students. More able and motivated students can work through the materials at their own pace. Less able or less motivated students are provided with measured supervision and assistance to keep them on track.

Information technology at North Coast Institute of TAFE

The approach to self-paced learning in the information technology program at the Port Macquarie campus is not predominantly classroom based, as it is in the earlier example for hairdressing at Adelaide. However it also aims to provide students with flexibility with some teacher-directed assistance if required. The first day of the orientation session is compulsory. From then on students are at liberty to complete all their work independently from home or from their workplace without ever visiting the institute until they need to take an assessment. They can study at their own pace and develop their own study and attendance pattern.

Before students are left to work independently they are provided with substantial preparation activities. An information session is held at the end of the year in preparation for the following year. This is followed by a formal orientation during the first week of the course. During the information session students are told about the self-paced learning process to be used for the course. Course handouts are given out and those students who would like to apply for the course are asked to send in completed application forms. These are processed and acceptances are sent out.

Attendance on the first day of the formal orientation week is compulsory. Here students are provided with information on the mechanics of self-paced learning programs and the study skills they will require if they are going to successfully complete the program. They are taken on a tour of the institute and introduced to the library and its

functions. They also receive information kits which include information on assessments, a timetable for keynote lectures and a schedule for laboratory sessions when computers are available. During the remainder of the week students are introduced to basic computing survival skills. They are then left on their own to work through tasks. Instructional support is provided in the computer rooms to all who ask for assistance either in person or by telephone.

Once the course proper has started, a set of face-to-face keynote lectures for each subject or module is presented over a three-week block. Each lecture is repeated on at least two occasions to cater for both day and evening students. The lectures are used to introduce students to information that teachers feel students may find difficult to understand if they were left to work through texts and learning guides independently. Each three-week block is followed by an exam week where assignments are due and assessments are completed.

Assessments take the form of a supervised test or a prescribed assignment. Students must request assessments 24 hours prior to the time they want to sit for their assessment. These assessments are supervised by lecturers. Students who are deemed to have passed the subject continue with the next block of subjects. If they have not passed a subject, a meeting is arranged to discuss the problem and to suggest remedial activities. A study plan is developed to help those students avoid the last minute rush to complete assignments or supervised tests without appropriate preparation.

The marks awarded for assessments and assignments are recorded on the student's file. This file details all assessments that are requested and taken and the results or adjustments to results that are obtained. In addition, the dat and details of any discussions with students are also recorded. Keeping a comprehensive file on students' activities allows the

lecturer to further monitor the progress of students. By being able to pinpoint whether or not the student has kept up with the assignments and assessments, lecturers are able to identify at a glance those students who need to be encouraged to keep up with their work and prepare for their assessments. In addition a study centre is now available at the library to help those students with literacy problems.

Most students choose to work entirely at the institute. They go to all the keynote lectures and attend all the laboratory sessions. However, there are still a small number of students who are never seen until assessment times. Coffee and chat sessions have also been introduced. These have been especially successful for evening students.

Perceived advantages

Teachers generally believe self-paced delivery, whether it is structured around classroom attendance or not, is effective for those students who want to work and are motivated to do assessments and achieve high grades. However, the method does not suit all students. Some students thrive on independent learning. Others require much more structure and do better in a face-to-face situation. However, students in flexible environments are better able to ask for individual instruction and attention.

It is also felt that the greatest advantages offered by self-paced learning relate to increased flexibility for students and responsibility for their own learning. This means that students can start a topic when convenient and progress through the topic at their own pace. They don't have to sit through hours of classroom instruction, and can take an assessment as soon as they feel ready to do so. This helps students to become organised, to maintain their own timetables, and develop initiative. However, lecturers also temper this by saying that the self-paced method is great for students who can manage their time and are motivated to complete their studies. The method also allows lecturers to become creative in the way that they design learning guides and resource materials.

Because self-paced methods generally require students to follow highly structured resource materials they are also considered to provide students with comprehensive and thorough instruction. This is because the materials are based on a type of mastery learning where students cannot proceed to the next topic until they have completed or mastered

a preceding topic. This is to say that there is little or no opportunity to skip some parts of the subject area because of lack of time, as is sometimes done in teacher-directed courses.

In addition, where students are encouraged to work in groups they develop the important key competency of working in teams.

Because students are working at their own pace it is sometimes felt that slower students may benefit from having the opportunity to take longer to complete tasks than is available to them in a traditional classroom.

Perceived disadvantages

The main disadvantages of the method are the lack of regular interaction between students and their peers, and students and their teachers. These concerns are especially relevant for students returning to study and students who require the discipline of regular contact with teachers to keep them on track. It is equally a concern for students attending institutes at night where contact with teachers and other students can be affected by time constraints.

There are also concerns about the ability of students with low literacy levels and low general ability, to cope with independent learning. However it is also acknowledged that flexible methods can allow slower students to take longer to complete their studies. Teachers also believe that less assertive students do not ask for assistance when necessary. Teachers also find that students are reluctant to admit that they are having problems.

There are concerns that students in flexible formats may want to rush through learning tasks and progress to an assessment with minimal work. This means that they may not benefit from having to sit through a series of lectures in which they can pick up extra incidental knowledge (tips, tricks, shortcuts, better methodology) that may not always be essential for assessment purposes.

Lack of interaction with others is also a problem for teachers who miss the interaction with students associated with regular classroom teaching. Teachers are sometimes unable to put names to faces because attendance by students at campus is spasmodic. Some teachers speak of the loss of satisfaction that not having this interaction brings. There is also a loss of a sense of belonging for both teachers and students. This is especially the case with students who are not campus-based.

However this may also reflect the need to manage a changed way of doing things. For teachers, it may mean delivering training via team teaching. For students, it may mean accepting a less formal relationship with their teachers. If either does not manage the change there can be a sense of loss. But if the change is successfully made then there is a strong sense of ownership; for the lecturers because they become involved in all the decision-making and planning, and for students because they take ownership of their own progress.

The need to allocate substantial amounts of time to keep accurate records and make sure that learning materials are available for students are other concerns for teachers. These responsibilities may make them feel more like administrators than educators and can add to their loss of work satisfaction. However, the use of databases which are tailored to deal with administrative requirements will reduce the workload associated with student assessments.

When one learning guide is used to cover a number of modules, there are also problems experienced in matching the guide to the right module. Difficulties are also experienced in getting the learning guide to match the prerequisite skills. In addition, once students have started the module, the guide cannot be adjusted to suit student choice.

The perceived lack of consolidated learning that may be encouraged under a system of independent learning for students is also a concern for teachers. Although the method is felt to produce similar outcomes to traditional methods of instruction, and allow for accelerated learning, there is a general feeling that it may take some students significantly longer to produce desired outcomes. In addition the resources in terms of teacher time, production of self-paced materials, and keeping track of student records is also more time consuming. The method is considered effective for students who have a good work ethic, and can manage their time well, and difficult for those who can't read and spell.

Although many courses have implemented programs for supporting students with specific problems outside of classes or laboratory sessions, providing students with adequate instructional support can be problematic. This is especially so when lecturers are rostered to facilitate laboratory sessions attended by students requiring assistance with topics which are beyond the expertise of the rostered lecturer. However, this is not a problem inherent in self-paced learning strategies but an indication of inadequate resourcing.

Accounting at Box Hill Institute of TAFE

The Beginning accounting module at Box Hill TAFE is delivered via a combination of traditional face-to-face delivery and self-paced learning strategies. The teacher will typically introduce a new topic or explain a common problem by a presentation using traditional 'chalk and talk' methods. This means using the blackboard to demonstrate specific calculations and problem-solving. Once these presentations are given, students are left to work through activities presented in the first of a number of reading guides. Once the activities in the first reading guide have been completed, students are given the next reading guide and so on.

Perceived advantages

The value of this instructional method is that students get the best of both strategies. They gain the benefit of teacher explanations when learning a new concept and immediate access to the teacher if they experience a problem while working through the activities in the reading guide. At the same time they can also proceed at their own pace and are not bound to waiting for others before proceeding to the next topic. Generally students who attend night classes are better able to cope with these methods than day classes.

Having the teacher readily available to explain concepts is especially important to students in accounting because accounting texts are sometimes not easy to read and some concepts difficult to understand. The teacher is available to provide in-depth explanations of concepts and assist in clarification. As well as providing guidance through the learning stages the teacher can monitor activities so that students are kept on task and on track.

The opportunity for teacher work satisfaction with these delivery methods is substantial. This is, in part, a consequence of the teacher

being intrinsically involved in guiding and monitoring student learning. It is also a result of producing the materials and resources to help students become independent and develop responsibility for their own learning. Watching students develop increased responsibility, and successfully work independently through problems, is also rewarding.

Perceived disadvantages

The main disadvantages with this type of delivery are similar to those experienced with the strategies which offer students opportunities for self-paced learning. These relate to the inability to monitor student progress if they decide not to come to class, and the strain involved in keeping up with the different activities when students are progressing at their own pace.

Other problems relate to students with low levels of literacy and motivation. Students with poor literacy skills find it hard to keep up with the program. Those with low motivation do not perform well.

Engineering at the Wirra Institute of TAFE

The Engineering drawing interpretation module at the Wirra Institute of TAFE for apprentices and pre-vocational students is presented using a combination of traditional and flexible delivery methods. New topics are introduced to students as a group in a predominantly 'chalk and talk' fashion. Students then work independently through exercises in a module workbook. Once students have completed exercises, they are asked to do a test. These are marked by the lecturer and the student proceeds to another section in the workbook. The teacher is on hand to provide assistance when requested. Because students in these classes are of different levels of motivation and ability, tutorials in the form of 'catch-up' nights are held to deal with students who get behind.

Perceived advantages

This method is suitable for those students who are bright, prepared to work hard and more mature in their approach to study. These students can generally complete their modules to, or well before, deadlines.

When students complete their work before the deadline they are provided with extra tasks as enrichment activities.

This form of delivery is not always considered to be the best form for all courses and it is felt that a self-paced approach might work better for practical workshops than for theory classes. This is because students may work through theory exercises at a fast rate and not fully comprehend or remember the concepts involved. For the theory components of modules such as Engineering drawing interpretation, a combination of 'chalk and talk', and self-paced methods is suggested. In this way teachers can better explain concepts and lead students through initial exercises to help them obtain better outcomes.

Perceived disadvantages

It is felt that students in these apprenticeship classes, who have completed high school to year 10 where the traditional method of instruction is far more widespread, generally struggle with this form of delivery. Younger students also tend to have problems.

It is also believed that there is a lot of wasted time in class as students who are working at their own pace may also take more time to complete exercises than they would do in a traditional class where they are expected to keep up with others and with the lecturer. This means that when the time for the completion of the module has run out there may still be students who have not completed all the exercises required for the module.

There are also concerns about the ability of students to work independently, read materials and follow instructions when they are not in the classroom, and the selection of students for the course.

Lecturers tend to spend more time with students who are having problems than those who are not. However, there are still instances where students do not ask for assistance when they are having problems. Because bright students are able to cope with the exercises required in the workbook, they do not request any additional assistance. This lack of regular interaction between lecturer and bright student reduces the opportunities for lecturers to pass on to them any tricks of the trade or other information that is helpful but not essential for the particular module being currently studied.

When students are expected to work independently through tasks and tests in a workbook and present these to be signed off by lecturers, there is the danger that, once exercises or tests are signed off and new ones commenced, students may not remember what they have already learned. In effect what they have done is to complete the exercises without fully understanding the concepts involved. This lack of emphasis on review and revision will be problematic for students in future courses. This will be especially evident in courses based on the underpinning knowledge obtained from prerequisite courses.

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Flexibility does not always lead to better module completion rates (Misko in press). Modules attempted via external studies had the lowest completion rates of five out of six of the discipline groups examined.

One explanation for these results has been provided by a survey of students in TAFE institutes in four Australian States (Misko in press). This survey found that the most common reasons for students choosing to study via flexible delivery strategies were lifestyle related. That is, they were attracted to these methods because they could adjust study patterns to suit family, work and social commitments. However, when we examine the information on completion rates and students' reports on the disadvantages of these methods, we find that it is this flexibility that may be interfering with their ability to complete their studies. Time after time flexible delivery students talk about their difficulties in disciplining themselves to get the work done. Teachers using these methods of delivery also cite student time management problems as major drawbacks to the success of flexible delivery methods.

Students who opt for alternative delivery strategies may believe that as busy people they require flexibility in attending classes and doing assignments so that they can attend to other commitments. However flexibility may not be what they need. It could be that busy people require increased structure rather than increased flexibility to assist them to complete their studies. For example, one of the most commonly provided training programs in business is time management. Busy executives are reminded to work to a definite schedule.

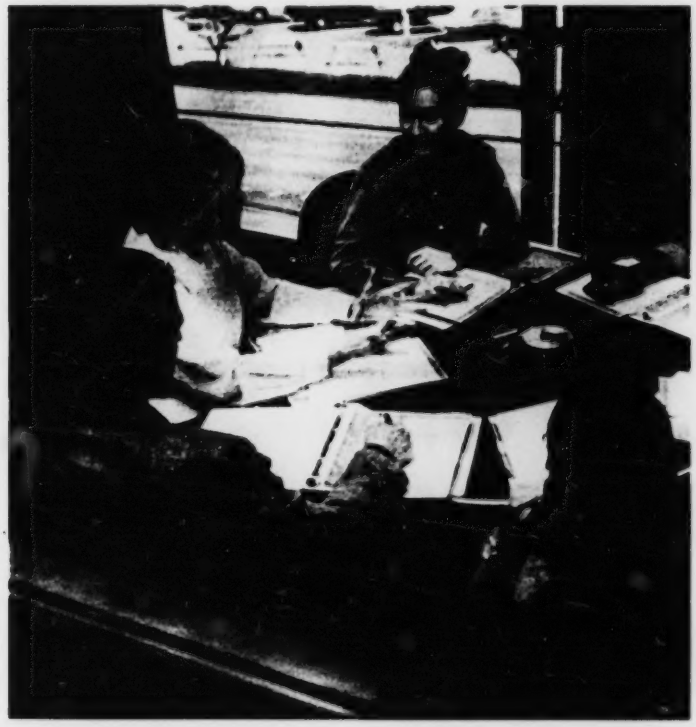
They are urged to develop lists of tasks that need to be completed and to prioritise these tasks so that the most urgent and most important are completed first.

They are then encouraged to stick to these priorities and complete the tasks before they move on to others. They try to do their best to reduce distractions so that they can complete their tasks. Every so often they review these priorities but they always make sure that they organise or structure their time to get things completed.

If students have problems completing work, then it may be that they should choose another method of delivery so that they have structured time set aside to devote to their studies and the rest of the time to devote to their other commitments. If unable to do this they should develop some effective time management techniques.

Individualised systems of education place responsibility for learning purely on the shoulders of the learner. This makes sense for learners who are self-motivated, resourceful and have the necessary cognitive and interpersonal skills required for successful independent study. Where these skills are insufficiently developed, rather than making the student an active participant in their own learning, such systems can further retard their progress by overburdening the information-processing capacity of the student.

Responsibility for student learning must belong to institutions and teachers and to the students. Institutions must help facilitate the learning process by providing appropriate resources and equipment to allow teachers to carry out their instructional duties and provide timely and effective feedback to students. They must also provide appropriate and sufficient resources for students to access learning. They must ensure that the courses they offer are rigorous enough so their graduates have valued credentials. Teachers must have the requisite knowledge, skills and resources to structure and facilitate learning programs in ways that meet the needs of external studies students. This means that they must be provided with the time and resources they require to develop programs. In addition they must have the ability and willingness to counsel, assist and encourage students throughout the learning process. Students in turn should be responsible for putting in the time and the effort to complete their studies. They should be encouraged to provide teachers with feedback on the difficulties they are experiencing with their suggestions for improvements.



A lesson to be learned from the experience of students and teachers in independent learning programs is that self-paced learning does not suit all students and teachers. It is most successful when students have the right motivation and academic skills to be able to work independently. It is also successful when teachers are able to devote considerable amounts of time and energy to making the process work, and where there is adequate interaction between teachers and students and students and peers.

The right student

Students who do well in the self-paced environment whether it be based on-campus or off-campus, have special skills and attributes. In particular, they require high motivation and self-discipline to fit in their studies with their other commitments. They need to be able to prioritise their time and tasks and stick to these priorities to get work completed. In addition, they need to have adequate literacy skills to be able to read information in study guides and texts, and to follow instructions. Where courses are provided online or by video-conferencing they need to feel comfortable using the technology.

Not all students are adequately motivated or skilled. Nor do all students want to work independently. Therefore it is important to provide substantial counselling to students before they decide to take up studies which are predominantly self-paced.

Even students who have high levels of motivation and skill for independent learning require regular interaction with other students to discuss common problems and issues, and to compare their work with others. They also require opportunities for personal contact with teachers to obtain clarification of problems they have encountered during learning.

The right teacher

Providing self-paced learning options for students requires teachers to be comfortable with the dual roles of facilitator and instructor. It also requires teachers who are prepared to devote substantial amounts of time, over and above what is normally required, to establishing appropriate learning processes. This means that learning materials need

to be prepared and constantly up-dated. Where commercial materials are used they need to be customised to suit local conditions. Record-keeping and filing systems need to be established and maintained. Constant monitoring of students needs to be undertaken to make sure that they do not slip too far behind.

The right social environment

Students working independently do not have opportunities to interact with their peers, to discuss common problems or to socialise with them in an informal manner. Teachers do not find out how students are progressing unless students contact them to discuss their work. This is why it is very important to build into the program structured activities which allow this interaction to take place.

Many flexible delivery programs have well-developed structures for regular interaction between teachers and learners. For online and external studies programs these include providing students with the email addresses of fellow students, posting information on electronic bulletin boards and setting up chat rooms on the Internet. Workshops and laboratory sessions which provide students with face-to-face interaction with other students and teachers can be structured into a self-paced program to help students overcome problems of isolation and provide them with opportunities to receive one-on-one instruction in areas where they are having difficulties.

Orientation workshops can be used to introduce students to teachers and other students. Keynote lectures throughout the course can also be used to provide regular interaction between students and teachers, and to explain concepts which are difficult to understand if students are studying independently. These can help to develop a sense of belonging in students and to provide them with the guidance required to continue their programs.

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This model is based on the need to provide students with appropriate guidance and counselling before and during their course, adequate facilities, learning materials and equipment, opportunity for regular interaction with other students and teachers, and timely and effective feedback. It comprises a number of consecutive and interdependent phases.

Phase 1: Create a climate for change

During this phase teachers are gradually introduced to changes which will require them to alter the way they have approached training in the past. This means providing teachers with staff-development activities focussed on the need for teachers to become facilitators of learning.

Staff-development activities also require training in adapting courses for independent study, establishing effective recording systems and developing workshops which help students to develop skills required for independent study.

Phase 2: Identify program needs

During this phase an assessment of needs is conducted. This assessment should identify if the material is suitable for a self-paced learning format, whether or not there is a need for the program to be delivered in a self-paced manner, the number of clients to be involved in the program, how and where the program will be delivered, the technology to be used, and the support that will be required.

Phase 3: Set goals and objectives

The goals and objectives of the program will be based on the results of the needs assessment. They will deal with the learning outcomes to be achieved, the assessment strategies to be used and the industry standards that will guide these assessments.

Phase 4: Identify resources to be used

This phase comprises identifying resources required for the program. Texts and other learning materials, audio-visual equipment, interactive technology facilities, space and storage areas will be chosen. It includes identifying resources, facilities and equipment already available and those that need to be purchased.

Phase 5: Develop learning materials

During this phase, the learning materials for the course are developed or modified. This will include the adaptation of existing courses, and the writing up of study guides and learning materials. Where commercially produced texts or learning materials from other providers are to be used it is also important to find out about copyright regulations.

The writing of customised materials can be achieved in two ways. Lecturers who have specific knowledge of the content area and have well-developed writing skills can develop the materials for their subjects. Alternatively lecturers can work in conjunction with writers who may or may not have specific knowledge of the content area. These materials should be thoroughly proofread before they are published so that any typographical errors are corrected, instructions are clear and solutions to problems are accurate.

Phase 6: Prepare students for learning

This phase is based on the need to prepare students for the requirements of independent learning. This means providing them with appropriate counselling before they commence courses. The counselling will establish whether students are suited to the demands of independent learning. Students should be highly motivated to work on their own, and have the requisite literacy skills. If students do not meet these criteria then they may be better served by face-to-face instruction.

During this phase, students are oriented to the formal demands of the program. They are provided with information on locations, learning outcomes, and assignment and assessment requirements. They are introduced to library facilities, and are given information on locations

and times for workshops, laboratory sessions, keynote lectures and access to equipment, such as computers.

If students are to successfully complete a self-paced program it is crucial that they understand the need to allocate adequate time and attention to their studies. It is for this reason that students need to be made aware of the need to develop priorities for their learning and effective techniques for managing their time.

Orientation should also set aside time for students to get to know each other, to exchange contact details and to set up self-help groups. Teachers should use such sessions to develop a rapport with students so that they will be prepared to contact them when they are having problems.

Phase 7: Implement the learning program

During this phase the learning program commences and students work through course materials or tasks, and undergo assessment. Instructors generally act as facilitators of learning, where they are on hand to provide guidance and assistance in the learning process. There may also be occasions when special workshops are held to introduce new topics, or to provide assistance to students who are having difficulties. It is always important for the instructors to provide students with timely feedback on assignments and assessments.

Phase 8: Monitor student progress

Once the course has commenced, it is important that teachers maintain regular contact with students. This can be done via telephone calls, email or in person. In this way teachers can help keep students on track, and provide support and encouragement when required. Feedback on assignments and assessments should be timely and provide students with adequate information to help them with further assignments or assessments.

In order to effectively monitor student progress teachers must develop effective records. Such records should be maintained so that teachers can easily locate information on the assignments and assessments that have been completed and the results that have been achieved.

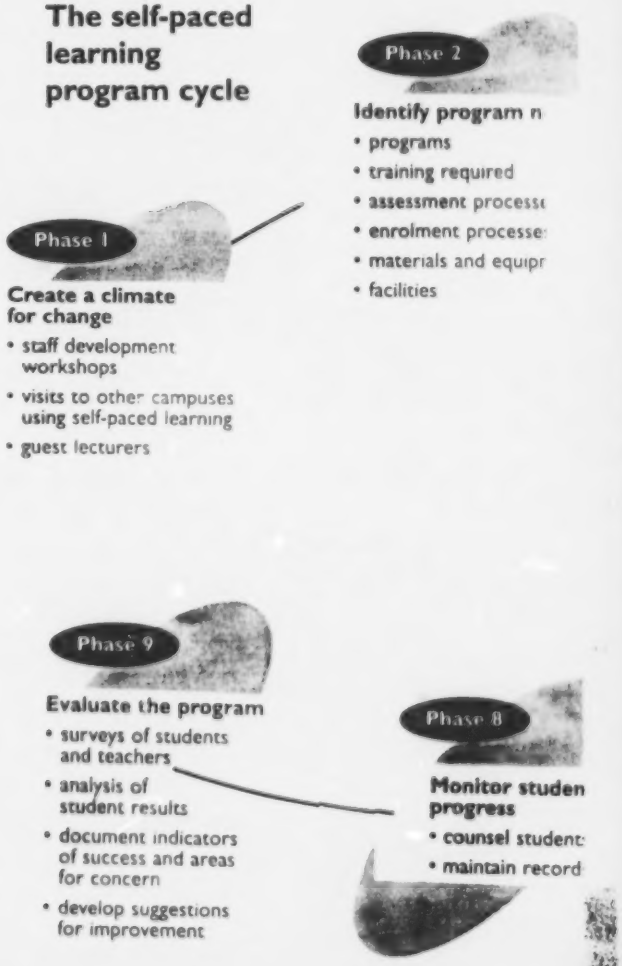
Phase 9: Evaluate the program

This phase is made up of two components which occur consecutively. The first component deals with the evaluation that is constantly going on as the program is being developed and delivered. It is based on consultations among teachers and students. These consultations can help to identify what is working well, what is not working and what needs to be done to overcome any immediate problems. This is generally called *formative evaluation*.

The second component of this phase is concerned with the evaluation that occurs once the program has been completed. Here information on the effectiveness of the program is gathered through formal surveys of students and other interested parties, and consultations between teachers, course writers and developers, and learning support staff, such as librarians, student counsellors and administrative staff. This is generally called *summative evaluation* and allows a thorough examination of the outcomes of the program. This information is then used to improve any subsequent programs. A schematic representation of this model appears in figure 1.

Figure 1

The self-paced learning program cycle



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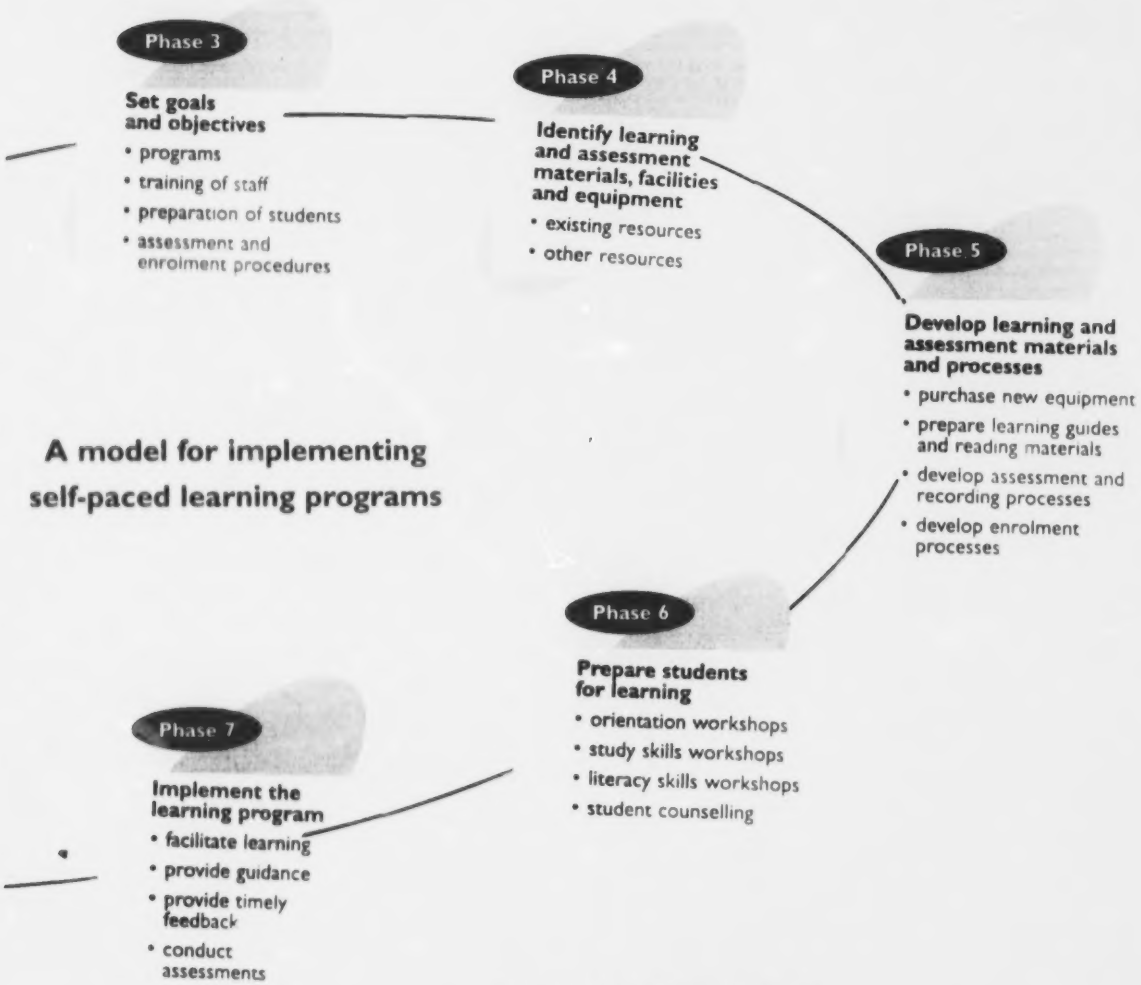
Summary

The intention of this booklet is to develop our understanding of the way we learn new information, and to examine the effectiveness of self-paced learning techniques. It has reviewed some of the findings from research into teaching and learning, and by presenting a set of case studies of programs in VET institutes which are designed to allow students to learn in a self-paced manner. Information for these case studies has been obtained from teachers delivering these programs and students undertaking these programs.

The self-paced learning program cycle sets out a nine-phase plan for implementing self-paced learning in vocational education and training programs.



A model for implementing self-paced learning programs

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Principles of learning

Misko, Josie (in press)
The effects of flexible modes of delivery: Student outcomes and student evaluations, **NCVER, Adelaide.**

Misko, Josie 1995
Transfer: Using learning in new contexts, **NCVER, Adelaide.**
Provides an overview of the way we learn new information. As well as providing the readers with fuller descriptions of the learning process, it presents a comprehensive reference list for each of the different aspects that have been discussed in the section examining how we learn.

Misko, Josie 1994
Flexible delivery: Will a client focus system mean better learning?, **NCVER, Adelaide.**
Provides an in-depth discussion of flexible delivery processes. It examines the effects of individualised methods of instruction based on the results of empirical studies. It also provides a comprehensive list of important references.

Self-paced technology-based learning

Booker, Di 1997
'Educational debate: A new paradigm for library and information services in the online learning environment?', unpublished, 24 pp.
This paper was written for the networked learner support (NLS) forum which comprises an online discussion and news forum focussing on NLS in higher education. It discusses the library/information service's role in supporting online learning programs. The 'Educational debate' paper, together with the mailing list postings, half-time and full-time summaries and responses can be found on the web at: http://netways.shef.ac.uk/discuss/arcintro.htm (current at 2 May 1997). Alternatively, contact the SA TAFE Clearinghouse for a copy of the paper and discussion.

Byrnes, Jill 1997

***Learning online: An assessment of educational technology for access to vocational education and training by remote Aboriginal communities in the Kimberley region of Western Australia*, Kimberley College of TAFE, Kununurra, WA, 68 pp.**

This preliminary study explores the possibilities of technology for overcoming barriers to access to vocational education and training (VET) by Aboriginal people living in remote communities in the Kimberley. The context of VET for these people is explored through a literature review. A discussion of the infrastructure that is required, users, advantages, and disadvantages is also included.

Central West College of TAFE 1997

***Virtual campus: Research and development project*, [Perth], ANTA, 48 leaves.**

The project explores various issues involved with the development of a model of Virtual Learning Environment and the successful implementation of such. Issues such as organisational implications, virtual campus platforms, staff development issues, courseware and curriculum issues, and learning resource centre implications, are discussed, and a model for the development of a Virtual Learning Environment for remote, rural and regional clients is recommended.

Chandler, Paul, Sweller, John, Jones, Bryan 1996

***Using cognitive science to develop new training techniques for the workplace*, University of New South Wales, Sydney, 18 pp.**

This paper is the final report of a project jointly undertaken by the University of New South Wales and Email Ltd. Its aim was to use the most recent findings in cognitive science to improve the quality of vocational education and training.

It was found that traditional methods of computer-based training and multi-media instruction used by vocational trainers are largely ineffective, compared to multi-media instruction based on cognitive models. Consequently, Email Ltd intends to use the findings when developing computer-based training packages.

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Corben, Helen 1997

'Going online: Teachers as "virtual" learners', in *Training Agenda*, vol. 5(4), November, pp.8–9, New South Wales Technical and Further Education Commission, Sydney.

This article is the personal account of the author's experience of enrolling in an online course taught via the Internet. She assesses the educational advantages and drawbacks of this type of course delivery and raises issues relating to the areas of access to technology, technological problems, interactivity and collaborative learning and time-dependent and real-time communication.

Didsbury, Martin et al.

***Mixed mode delivery*, Media Production Unit, Open Training and Education Network (OTEN) (NSW), Sydney, 1 videocassette (VHS), (49 min, 09 sec).**

This video is an example of flexible delivery in action. It shows students combining distance education materials and face-to-face sessions. This means that students are able to learn at a time and place that suits them, while still having access to the support available in a traditional classroom.

Aimed at TAFE teachers and managers, this program explores key questions that mixed-mode raises. Which courses are suited to mixed-mode delivery? How do you select students for mixed-mode learning? How are teachers making the transition from traditional delivery to mixed-mode? What administrative hurdles does mixed-mode delivery present? Is mixed-mode cost effective?

Downie, Andrew 1995

'Advancing technology offers more flexible educational options for students who are blind or who have a vision impairment', paper presented at 1995 conference of ARATA (Australian Rehabilitation and Assistive Technology Association), unpublished, 6 pp.

This report briefly examined the ways technological advances could improve communication facilities used by people who are blind or vision impaired.

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Else, Ruth 1998

***Message received: Use of online technology for the delivery of vocational training to remote North-West Australia: A feasibility study*, Hedland College Social Research Centre, South Hedland, WA, 24 leaves, maps.**

This study investigates the feasibility of developing an external delivery of a full-time vocational course using online technology to areas where course numbers are small or where distance is a limitation to the conduct of a conventional course. It looks at issues relating to the delivery of vocational education and training (VET) to remote students in the North-West and how online technology can be used to make the delivery of training more appropriate and accessible to the learner.

Goldman, Sue 1997

'Change management for online delivery: Strategies for organisations moving to online delivery', paper presented at Networking 97: Shaping the Online Learning Environment—ANTA Flexible Delivery Conference, Adelaide, 19–21 November 1997, unpublished, 7 pp.

This paper examines several theoretical frameworks for change processes which can be adopted for managing the introduction of online delivery into an organisation. Models examined include: Concerns-based Model; Soft Systems Methodology; Four Stage Problem Based Model; Framework 'From Chalkface to Interface'; and New Learning Technologies Planning Model.

Goldman, Sue, Lea, Sue, Ryan, Tony 1997

***Evaluating online delivery: Communication studies at Adelaide Institute*, Adelaide Institute of TAFE, Adelaide, 55 pp.**

This evaluation report presents the findings of a study which set out to evaluate online delivery and face-to-face delivery.

This report is also available on the web at:
http://www.tafe.sa.edu.au/lsrsc/projects/index.htm (current at 2 May 1997).

Gooley, Anne 1998

'Integrated online learning services for vocational education and training', in *Second Australia–Taiwan Conference on Vocational Education and Training: Proceedings, 2–3 March*, Second Australia–Taiwan Conference on Vocational Education and Training, Chung-Li, Taiwan, pp.11–19.

This paper provides an overview of the development of online services offered by the Queensland Open Learning Network for the vocational education and training sector.

Hudson, Larry R, Halfhill, Sue, Palmer, Julie, Greer, Linda, Raquet, Charles, Paugh, Robert 1997
'Use of the world wide web for completion of required courses in vocational teacher certification', in *Good thinking, good practice: Research perspectives on learning and work*, conference proceedings, vol. 3, Griffith University, Brisbane, pp.199–206.
This paper describes the use of the world wide web for course delivery to adult full-time workers enrolled in part-time courses. Initial survey results from student feedback are included.

Jasinski, Marie 1998
***Teaching and learning styles that facilitate online learning: Documentation project: Project report*, 1 vol., Douglas Mawson Institute of TAFE, Adelaide.**
The report presents findings from the findings of a study which investigated the teaching and learning styles that facilitate online learning in the VET sector. The full report can be found on the Internet at: http://www.tafe.sa.edu.au/lsrsc/one/natproj (accessed 22 May 1998).

MacNamara, Dennis, Dobbs, Graeme 1997
'Learning on the ether: Some toes in the water', in *ODLAA Occasional Papers* (3), February, Open and Distance Learning Association of Australia, Charles Sturt University, Wagga Wagga, pp.55–57.
This article describes the introduction at the Open Training and Education Network (OTEN) of the use of the Internet for course delivery. Some issues which have emerged from the use of electronic delivery are discussed.

Maglen, Leo, Lee, Kar-Tin 1997
'Transfer of traditional education and training programs to online learning opportunities', working paper, no. 5, DVET, [Melbourne], 6 pp.
The authors contend that there is a growing realisation that the digital revolution is bringing about a convergence in education and training—the flexible delivery of education and training and the internationalisation of education and training. The Department of Vocational Education and Training (DVET) of Melbourne University is now confronting the issues involved in establishing new ways of teaching and learning.

McGowan, Andrew 1998

'New masters of art', in *Australian Training Review* (28), Sept/Oct/Nov, pp.10–12, NCVER, Adelaide.

OnFX is an online and CD-ROM delivery system that has been in development for over two years. This article reviews the development of this online learning system, describes its component parts, discusses delivery costs and physical facilities and looks toward the future. For further information or a sample of the OnFX learning system, visit the OnFX web site: http://onfx.techworks.com.au/enrol.asp (current at 10 November 1998).

McIntyre, Louise 1995

'From stand-alone to support: The mixed mode option', paper presented at the OTEN Instructional Design Forum, 13 April 1995, Open Training and Education Network, unpublished, 9 pp.

This paper discusses the implications of mixed mode delivery for the design of learning materials. It also discusses what mixed mode is and its significance to OTEN.

Mitchell, John, Bluer, Robert 1997

***Planning model for innovation: New learning technologies*, Office of Training and Further Education, Melbourne, 154 pp.**

This publication presents the findings from a series of case studies and consultations to illustrate and inform assessments of the effectiveness of various new learning technologies. It includes a set of qualitative and quantitative performance indicators to enable assessment of new learning technologies (NLT) effectiveness; checklists to aid selection of appropriate technology; implementation proposals; an action plan; and eight case studies.

Murphy, Clare 1997

***Virtual library: Library support for online learners in the vocational education and training sector*, online publication, 46 pp.**

This report discusses the findings of a national project focussed on the role that libraries in the VET sector can, and should, play in the provision of information literacy training for students studying VET courses online.

The full project report is accessible online at:
http://www.tafe.sa.edu.au/lsrsc/one/natproj/il/rep/contents.htm
(accessed 12 May 1998, OLEARN abstract).

New South Wales Technical and Further Education Commission, Staff Training and Development Bureau 1997
***Audiographics: A technology and techniques module*, [New South Wales],: TAFE NSW, Sydney, 21 pp.**
The document forms part of the kit, Technology and techniques modules. Other documents in the kit are 'Cable TV' (TD/NSW 50.22), 'Multi-media' (TD/NSW 50.23), 'Learning guides' (TD/NSW 50.25), 'Video-conferencing' (TD/NSW 50.26), 'Electronic communication' (TD/NSW 50.27), 'Computer managed learning' (TD/NSW 50.28) and 'Satellite and interactive television' (TD/NSW 50.29). The Technology and techniques kit is one of three kits in the Emerging Practices in a Flexible Learning Organisation Program. Other kits are Change management modules and Process modules.

Palmieri, Phoebe et al. 1996
***From chalkface to interface: Developing online learning*, 1 vol. OTFE, Melbourne, (various pagings) (Benchmarking for educational effectiveness program).**
The use of the Internet and other networked technologies as a means to facilitate learning is an increasing interest of both educators and government. Case studies are used to describe a framework for the successful use of these technologies.

Prentice, Toby 1998
'Attitudes and access to online training: TAFE trainers and trainees', in *TAFE NSW Research Association Conference: Papers presented at the 1997 conference held at Sydney Institute of Technology Ultimo Campus, December 1997*, [TAFE NSW Research Association], [Sydney], pp.324–340.
This report presents findings from a survey set out to gauge the level of interest among TAFE Communication students and teachers around New South Wales in online training.

Shaw, Greg 1995
'Training of vocational educators in rural and remote contexts of the Northern Territory: Research in progress', presented at the NCVER/ Northern Territory University Conference/Workshop, Vocational Education and Training Research, Darwin, July, NCVER, Adelaide, unpublished, 14 pp.
This paper describes ongoing current research by the author into the approaches to learning used by students, isolated from the university while on this course. The context and the methodology of the research are described and some preliminary findings are discussed.

Sheil, Patricia M 1998

'Cognitive load and self-paced learning in vocational education and training', paper presented at the 7th Annual VET Researchers Conference, Charles Sturt University, Wagga Wagga, NSW, 14–17 July, NCVER, Adelaide, unpublished, 8 pp. plus appendices

This paper reports on a study that was undertaken in response to concern with the level of failure and/or non-completion of modules within the Business, Computing and Management Team at Centralian College since the introduction of flexible delivery. It is part of a larger study of flexible delivery. The study highlights the difficulties associated with learning more complex material in a purely visual mode, and looks at whether self-paced learning is more or less effective than lecturer-directed learning.

Shore, Di et al. 1996

'Making rhetoric reality', in *Training Agenda*, 4(3), August, pp.11–13.

This article describes different approaches to technology-based teaching from institutes in New South Wales. It describes the way multi-media education has been included as a major strand in the Diploma of Information Technology (Business Systems). Also discussed are factors that need to be considered by institutes before embracing the Internet and multi-media for instruction. A comparison is made of delivery of instruction by these technologies and traditional models of flexible delivery.

Smith, Erica, Lowrie, Tom, Hill, Doug, Bush, Tony, Lobegeier, Janene 1997

***Making a difference? How competency-based training has changed teaching and learning*, Charles Sturt University, Wagga Wagga, 234 pp.**

This publication reports findings which confirm that teachers and trainers use an assortment of strategies depending on the industry for which they are training people, the type of VET provider they work for, and the nature of their student or trainee group. For instance, self-paced learning was found to be most suitable for mature adults without literacy problems. Teenage students and trainees are best taught as a group. Students and trainees from a non-English-speaking background find the practical nature of competency-based training assessment helpful because they did not need to do so many written tests.

Tinkler, Don, Lepani, Barbara, Mitchell, John 1996

***Education and technology convergence: A survey of technological infrastructure in education and the professional development and support of educators and trainers in information and communication technologies*, commissioned report, National Board of Employment, Education and Training, Australia, AGPS, Canberra, no. 43.**

This project examined the impact on the delivery of education of convergent communication and computer technologies. It also investigated the employment and training consequences of that convergence.

Villanova, Sandra 1997

'Pleasures and pitfalls of computer-based instruction', in *Training Agenda*, vol. 5(4), November, pp.12–13, New South Wales Technical and Further Education Commission, Sydney.

The author of this article believes that the value of computer-based instruction (CBI) as a teaching/learning tool is overstated. In the article she considers the economic feasibility of CBI, issues involved in CBI design and the implications for teaching and learning.

Webb, Greg 1998

'Theoretical framework for Internet-based training at Sydney Institute of Technology', in *ODLAA occasional papers*, (1), June, Open and Distance Learning Association of Australia, Charles Sturt University, Wagga Wagga, pp.17–38.

This paper describes the work done at the Information Technology teaching section at Sydney Institute of Technology in creating a theoretical model of Internet-based training and a plan for its implementation within a TAFE NSW context. The model examines what it means to use the Internet as a substitute for the classroom in learning and teaching without sacrificing all the advantages of face-to-face teaching.

Getting to **grips**
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Webb, Greg 1997

'New learning environment for college-based programmes: Internet-based training', in TAFE NSW Research Association Conference, TAFE NSW Research Association, Sydney, pp.181–205.

This paper examines what it means to use the Internet as a substitute for classroom learning and teaching without sacrificing all the advantages of face-to-face teaching. It also identifies new learning opportunities that go beyond what is possible in the classroom setting. A model of Internet-based training is described which is applicable to all academic disciplines. The model supports learning and teaching for an entire course and is easily scaled down to individual subjects or scaled up to multi-course applications.

It is not suggested that Internet-based training replace classroom learning and teaching. Instead, it is suggested that institutes use Internet-based training to expand the market for their educational products and to improve the quality of education to existing institute clients.

Wheeler, Leone 1996

***Teaching and learning online: A manual for teachers in vocational education*, research report OTS003/RR, Open Training Services, Footscray, Victoria, 66 pp.**

This manual is a guide to online delivery of vocational education and training programs via the Internet. Primarily, it is designed for teachers and trainers who may be considering how online programs can enrich the learning environment and increase access for learners.

About the series

The *Getting to grips with ...* series has been written for the general reader who wants to understand important trends in vocational education and training.

Each booklet is in two parts. The first part comprises a description of the subject matter in a manner which is intended to be clear to any interested layperson. The second part gives an annotated list of publications for those who want to read further.

About the author

Josie Misko is a research fellow at NCVER and has extensive experience in the area of VET research and evaluation.

She has written and researched in the areas of flexible delivery, student outcomes, transfer of knowledge, work experience, workplace training and assessment, VET in secondary schools, competency-based training and assessment processes, and transition pathways.

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